

Investigation and treatment of thyroglossal cysts in children

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SUMMARY

Thyroglossal cysts are the commonest midline neck masses in children. To evaluate current practice questionnaires were sent to all ear, nose and throat (ENT) and paediatric surgeons in the UK and 72% responded. The commonest investigation requested was an ultrasound scan (54%) and the commonest operation was a variant of Sistrunk's procedure (78%). Paediatric surgeons did fewer investigations than ENT surgeons and tended to excise more of the thyroglossal tract. Review of the published work suggests that ultrasound scanning and Sistrunk's procedure are the best management policy. The scan can avoid inadvertent excision of an ectopic thyroid gland. Extensive thyroglossal tract excisions give lower recurrence rates.

INTRODUCTION

Between the fourth and seventh weeks of development the thyroid gland descends from the site of the foramen caecum in the base of the tongue to its final position anterior and lateral to the trachea¹. The thyroglossal tract connects the descending thyroid gland to the tongue and degenerates by the tenth week. It passes through the muscles of the tongue and then anterior to the hyoid bone and larynx, being intimately related to the central portion of the hyoid bone². Anomalies of thyroid gland development include thyroglossal cysts, which are cystic remnants of the thyroglossal tract, and ectopic thyroid glands, which result from incomplete descent of the thyroid gland. Both may be found anywhere along the path of descent of the thyroid gland³.

Thyroglossal cysts are the commonest cause of anterior midline neck masses in children and typically move upwards on tongue protrusion. The differential diagnosis includes ectopic thyroid tissue, dermoid cyst, branchial cleft cyst, cystic hygroma, lymph node, lipoma and sebaceous cyst⁴. Indications for excision may include cosmetic appearance, recurrent infections, sinus or fistula formation and the risk of malignant change.

Investigations that may be performed include ultrasound scanning, radioisotope scanning and thyroid function tests. There is variation between surgeons in the preoperative investigations requested for a mass with the clinical features of a thyroglossal cyst⁵ and in the type of operation performed⁶. The classic operation was described in 1920 by

Walter Ellis Sistrunk of the Mayo Clinic, and consists of excision of the thyroglossal cyst, the central portion of the hyoid bone and a core of tissue around the thyroglossal tract to open into the oral cavity at the foramen caecum⁷.

We have surveyed the current practice of ear, nose and throat (ENT) surgeons and paediatric surgeons in the UK and have reviewed published work on investigation and treatment of thyroglossal cysts in children.

METHODS

An anonymous postal questionnaire was distributed to all 537 members of the British Association of Otolaryngologists—Head and Neck Surgeons and all 109 members of the British Association of Paediatric Surgeons resident in the UK on 1 January 1998. The total number of surgeons surveyed was 646, and the questions on investigation and treatment are listed in the left-hand column of Table 1.

RESULTS

463 surgeons replied (72% overall response rate), including 369 ENT surgeons (69%) and 94 paediatric surgeons (86%). The number who currently managed thyroglossal cysts in children was 440, including 350 ENT surgeons and 90 paediatric surgeons. The responses of these 440 surgeons are shown in Table 1 and Figures 1 and 2. The overall figures are biased towards the practice of the ENT surgeons because they were in the majority.

The investigations most commonly requested overall (see Table 1 and Figure 1) were an ultrasound scan (54%), a radioisotope scan (21%) and thyroid function tests (18%). Investigations included in the 'other' category were requested by 30% of surgeons and consisted of a computed tomographic scan, a magnetic resonance scan, radiography,

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Table 1 Responses

	ENT surgeons	Paediatric surgeons	Total
Numbers			
Number of questionnaires sent	537	109	646
Number of replies received	369	94	463
Number treating thyroglossal cysts in children	350	90	440
Investigation	No. (%)	No. (%)	No. (%)
(1) No investigations	85 (24)	57 (63)	142 (32)
(2) Ultrasound scan	210 (60)	27 (30)	237 (54)
(3) Radioisotope scan	86 (25)	6 (7)	92 (21)
(4) Thyroid function tests	77 (22)	3 (3)	80 (18)
(5) Other	13 (4)	0 (0)	13 (3)
Treatment	No. (%)	No. (%)	No. (%)
(1) Excision of thyroglossal cyst only	5 (1)	0 (0)	5 (1)
(2) Excision of thyroglossal cyst and central portion of hyoid bone	79 (23)	6 (7)	85 (19)
(3a) Excision of thyroglossal cyst, central portion of hyoid bone and thyroglossal tract to muscles of tongue	121 (35)	30 (33)	151 (34)
(3b) Excision of thyroglossal cyst, central portion of hyoid bone and thyroglossal tract to just short of foramen caecum	91 (26)	42 (47)	133 (30)
(3c) Excision of thyroglossal cyst, central portion of hyoid bone and thyroglossal tract to open into oral cavity at foramen caecum	2 (1)	0 (0)	2 (1)
(4) Other	52 (15)	12 (13)	64 (15)

fine needle aspiration cytology and full blood count. 32% of surgeons requested no investigations and some did more than one.

The two groups differed greatly in the proportions favouring investigations of all kinds ($P < 0.005$, chi squared test) except 'other' ($P = 0.048$, Fisher's exact test). Paediatric surgeons tended to request fewer investigations.

The treatment most commonly performed overall (see Table 1 and Figure 2) was a variant of Sistrunk's procedure. The thyroglossal tract was excised to the muscles of the tongue by 34%, to just short of the foramen caecum by 30%, to open into the oral cavity at the foramen caecum by 30% and to open into the oral cavity at the foramen caecum by 0.5%. The remaining surgeons undertook excision of the thyroglossal cyst only (1%), excision of the thyroglossal cyst plus the central portion of the hyoid bone only (19%) and procedures included in the 'other' category (15%). 'Other' comprised excision of the thyroglossal tract 'as far as it could be followed' rather than to a given level (13%) and excision of a variable proportion of the thyroglossal tract but not the central portion of the hyoid bone (1%). The overall proportion of

surgeons performing a variant of Sistrunk's procedure was therefore 78%. The paediatric surgeons tended to excise more of the thyroglossal tract than did the ENT surgeons ($P < 0.005$, χ^2 for trend test).

DISCUSSION

This questionnaire was distributed to a population that included most of the surgeons managing thyroglossal cysts in children in the UK, and the 72% response rate means that the results should represent current management.

The commonest preoperative investigations requested overall were ultrasound scans and radioisotope scans. The main rationale for requesting these investigations is to avoid inadvertent excision of a mass with the clinical features of a thyroglossal cyst which is in fact an ectopic thyroid gland containing the patient's only functioning thyroid tissue. Ectopic thyroid glands in children are commonly associated with normal thyroid function⁸. There are many case reports of profound hypothyroidism resulting from excision of ectopic thyroid glands that were mistaken for thyroglossal cysts. The consequences include the complications of

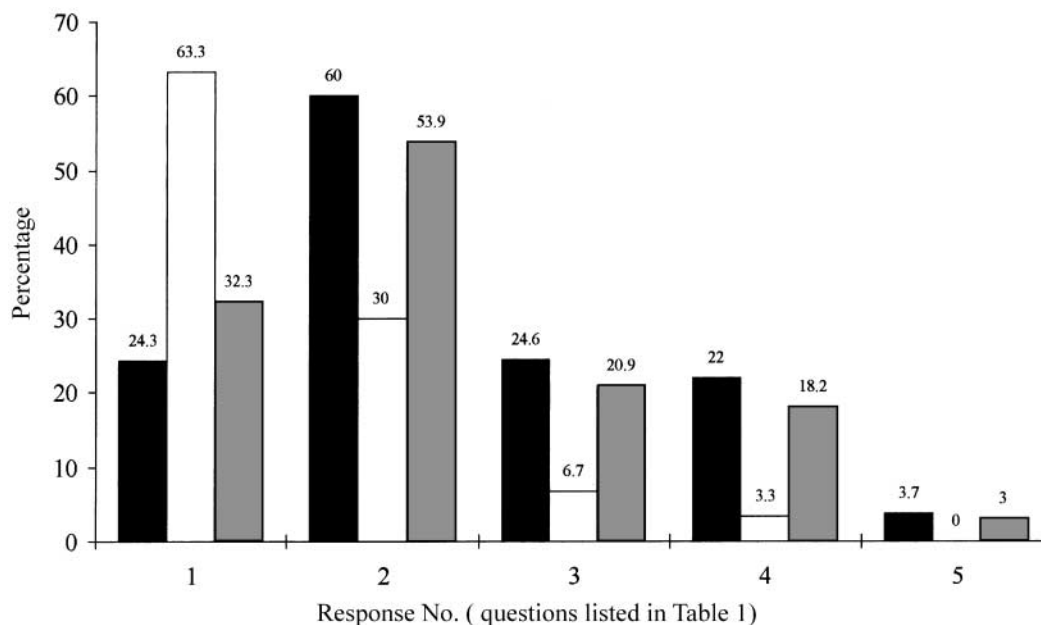


Figure 1 **Investigations performed.** ■ ENT surgeons; □ paediatric surgeons; ■ overall

hypothyroidism and the need for lifelong medication with thyroxine. One group reported 5 such cases in a series of 169—an incidence of approximately 1 in 34—and reviewed 17 previously reported cases⁹. A previous survey of paediatric otolaryngologists and general surgeons in the USA showed that 121 out of 368 respondents had encountered ectopic thyroid tissue in the neck which represented the patient's only functioning thyroid tissue⁵. These reports support our opinion that a mass with the clinical features of a thyroglossal cyst should not be removed without previous imaging to confirm the presence of a normal thyroid gland separate from the mass.

Our results show substantial differences between the practices of the two groups of surgeons, with ultrasound scans being requested by 60% of ENT surgeons and 30% of paediatric surgeons and radioisotope scans by 25% and 7% respectively. Both groups, particularly paediatric surgeons, should be encouraged to request preoperative imaging. An ultrasound scan is preferable to a radioisotope scan because it does not expose the child to radiation and is less expensive. The high resolution of modern ultrasound scans makes detection of abnormalities straightforward¹⁰. If on the ultrasound scan a thyroid gland is present in its normal position and has a normal appearance it can be assumed to

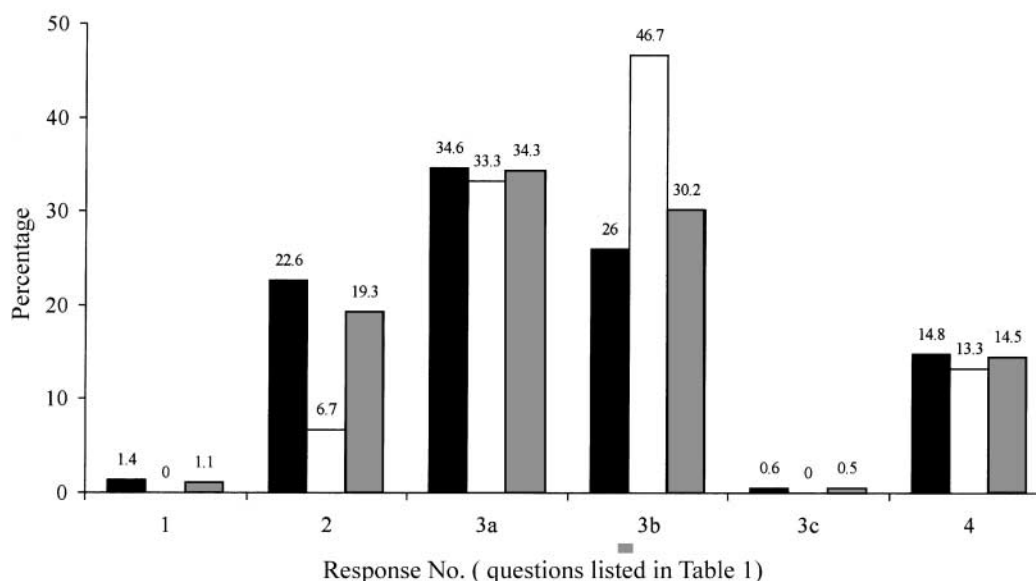


Figure 2 **Treatments performed.** ■ ENT surgeons; □ paediatric surgeons; ■ overall

have normal function¹¹. Thyroid function tests and/or a radioisotope scan may be performed if the patient is clinically hypothyroid or if no thyroid gland is seen on ultrasound scan¹¹.

The commonest treatment performed overall was a variant of Sistrunk's procedure in which the thyroglossal tract was excised to a variable extent. Our results show a distinct trend for paediatric surgeons to excise more of the thyroglossal tract than ENT surgeons. In our opinion the most appropriate treatment is a variant of Sistrunk's procedure. This ensures that, as well as the thyroglossal cyst, remnants of the thyroglossal tract from which recurrences could develop are excised. The central portion of the hyoid bone should be excised because the thyroglossal tract has such an intimate relationship to it that dissection from the surface of the bone is difficult². With the introduction of this procedure¹² the recurrence rate fell from 50% to 20%³. A core of tissue around the thyroglossal tract should be excised because the tract itself is difficult to follow⁶ and because it may be associated with accessory tracts¹³. With the introduction of this procedure⁶ the recurrence rate fell from 20% to 4%¹⁴. We believe the thyroglossal tract should be dissected to just short of the foramen caecum since this technique is associated with a lower recurrence rate¹⁵. Extension of dissection into the oral cavity may not be necessary; although part of the original description, this was not included in a subsequent description of the procedure¹⁶.

In conclusion, our review of the published work indicates that children with suspected thyroglossal cysts should have an ultrasound scan and that the most appropriate operation is a variant of Sistrunk's procedure. At present a substantial proportion of surgeons do not follow such a policy. We recommend in particular that paediatric surgeons should request more preoperative investigations and that ENT surgeons should excise more of the thyroglossal tract.

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